

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,846,369 B1
APPLICATION NO. : 09/656626
DATED : January 25, 2005
INVENTOR(S) : Steven A. Clark and Balathandan S. Pillai

Page 1 of 7

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The title page showing the illustrative figure should be deleted to be replaced with the attached title page.

The drawing sheets 1-4, consisting of Figs. 1-7, should be deleted to be replaced with the drawing sheets, consisting of Figs. 1-7, as shown on the attached pages.

Claim 1, line 24, please replace "aluminium" with --aluminum--.

Claim 6, line 35, please replace "02%" with --0.2%--.

Claim 14, line 54, please replace "a" with --aluminum--.

Claim 14, line 60, please replace "Inch" with --inch--.

Claim 20, line 36, please replace "4%0" with --4%--.

Claim 24, line 45, please replace "20" with --23--.

Claim 27, line 58, please replace "off" with --offset--.

Claim 25, line 48, please delete "is" before the word "has".

Claim 30, line 64, before "aluminum" please insert --the--.

Claim 31, line 66, before "aluminum" please insert --the--.

Claim 32, line 1, before "aluminum" please insert --the--.

Claim 36, line 3, before "aluminum" please insert --the--.

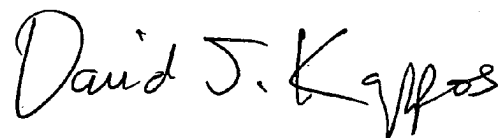
Claim 37, line 5, before "aluminum" please insert --the--.

Claim 38, line 7, before "aluminum" please insert --the--.

Claim 39, line 9, before "aluminum" please insert --the--.

Signed and Sealed this

Nineteenth Day of January, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style with a large initial 'D' and a stylized 'K'.

David J. Kappos
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Clark et al.

(10) Patent No.: **US 6,846,369 B1**
(45) Date of Patent: **Jan. 25, 2005**

(54) **METAL ALLOY PRODUCT AND METHOD FOR PRODUCING SAME**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/656,626**

(22) Filed: **Sep. 7, 2000**

Related U.S. Application Data

(63) Continuation of application No. 09/376,067, filed on Aug. 17, 1999, now Pat. No. 6,146,477.

(51) Int. Cl.⁷ **C22C 21/00**

(52) U.S. Cl. **148/417; 148/415; 148/416; 148/549**

(58) Field of Search **148/415, 416, 148/417, 549, 688, 437, 438, 439, 440**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,496,624 A	2/1970	Kerr et al.	29/196.2
3,791,876 A	2/1974	Kroger	148/2
4,055,417 A	10/1977	Komiyama et al.	75/142
4,693,747 A	9/1987	Bretz et al.	75/249
4,715,893 A	12/1987	Skinner et al.	75/249
5,032,359 A	7/1991	Pickens et al.	420/533
5,303,682 A	4/1994	Donahue et al.	123/193.1
5,498,393 A	3/1996	Horimura et al.	419/28
5,520,754 A	5/1996	Yaney et al.	148/550
5,527,403 A	6/1996	Schirra et al.	148/675
5,571,347 A	11/1996	Bergsma	148/550
5,595,615 A	1/1997	Shibata et al.	148/440
5,603,783 A	2/1997	Ferreira	148/549
5,744,734 A	4/1998	Yang et al.	75/249
5,837,070 A	11/1998	Sainfort et al.	148/552

5,846,348 A	12/1998	Sakoda et al.	148/439
5,911,843 A	6/1999	Bergsma	148/550
6,120,625 A *	9/2000	Zhou et al.	148/690
6,248,189 B1 *	6/2001	Shaffer et al.	148/417
6,350,329 B1	2/2002	Troeger et al.	
2001/0023719 A1	9/2001	Troeger et al.	

OTHER PUBLICATIONS

"Aluminum and Aluminum Alloys", ASM International, 1993, p. 72, 73.*

"Metals Handbook: Desk Edition", 2nd ed., ASM International, 1998, p. 464.*

"ASM Handbook: vol. 9 Metallography and Microstructures", ASM International, (1985), pp. 357-388.*

Brick, Robert M. et al., Structure and Properties of Engineering Materials, 1977, title p. and pp. 87-91, Fourth Edition, McGraw-Hill Publishing Company, New York.

Chu, H.P. et al., Fracture Toughness and Stress Corrosion Properties of Aluminum Alloy Hand Forgings, Journal of Materials, Mar. 1972, pp. 95-99, vol. 7, #1.

Dieter, George E., Mechanical Metallurgy, 1986, cover, title p. and pp. 526-529, Third Edition, McGraw-Hill Publishing Company, New York.

(List continued on next page.)

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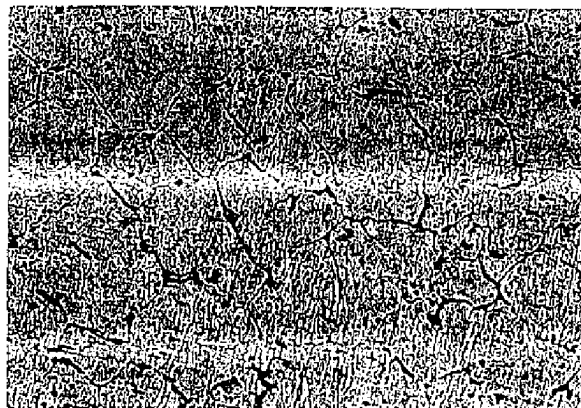
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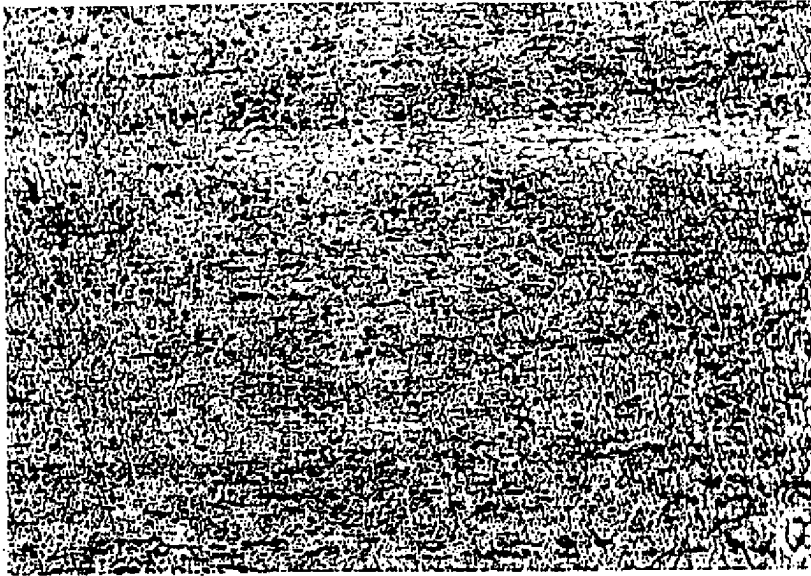
ABSTRACT

A method for producing a cast aluminum alloy article having high strength and/or toughness is provided. The method includes providing a molten aluminum alloy, centrifugally casting the molten aluminum alloy to form a cast body; and hot isostatically processing the cast body to form a hipped body. The hipped body may optionally be solution heat treated to form a heat treated body, which may subsequently be precipitation hardened to further enhance the properties of the cast product as desired. The method allows the production of cast aluminum alloy articles having physical and mechanical properties similar to those obtained for articles produced from corresponding aluminum alloy chemistries by wrought techniques.

39 Claims, 4 Drawing Sheets

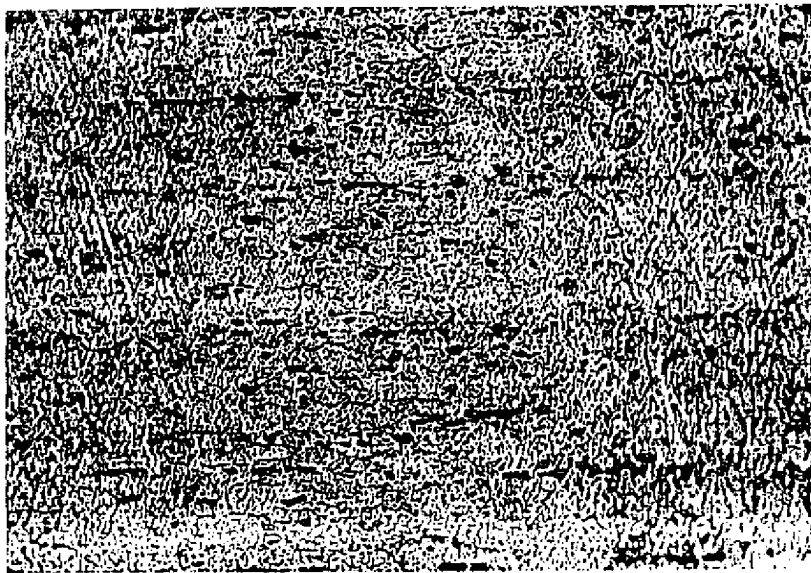


200X CENTRIFUGAL CAST AND HIPPED JC6061-T6C



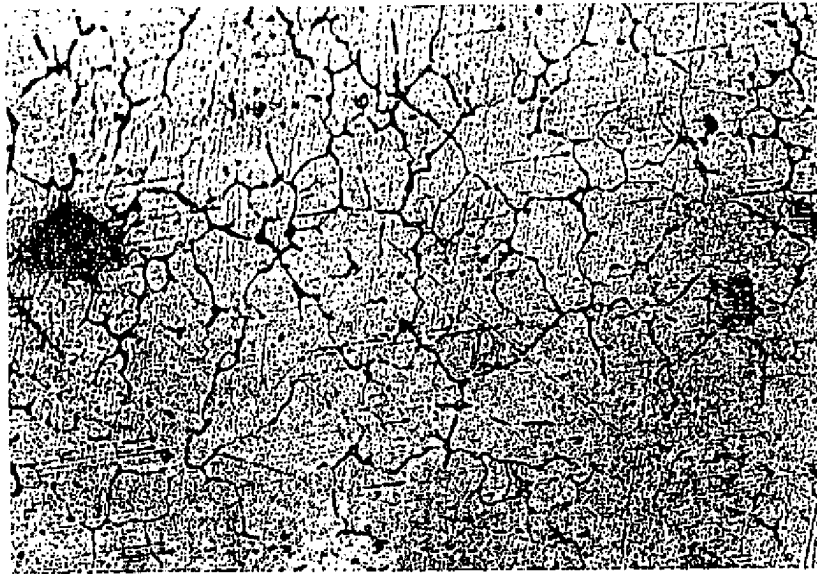
100X 6061-T651 WROUGHT PLATE

FIG. 1



200X 6061-T651 WROUGHT PLATE

FIG. 2



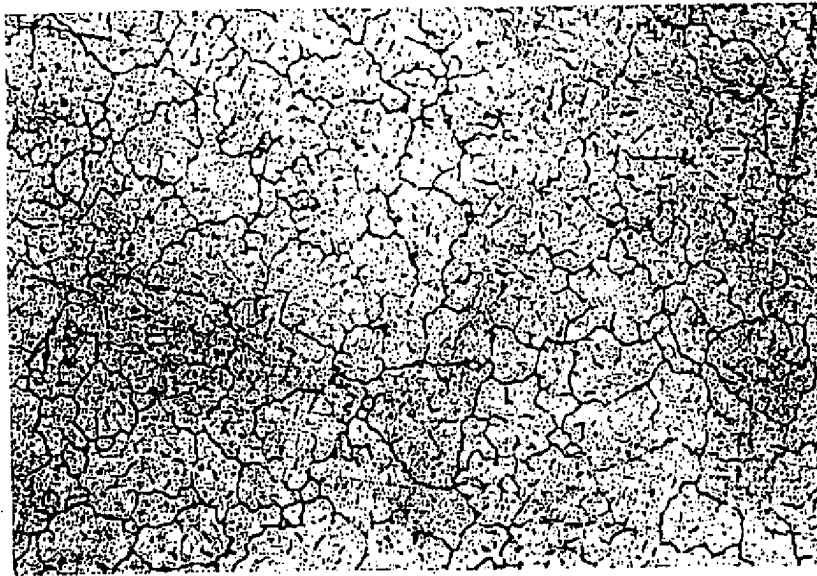
100X UNHIPPED CENTRIFUGAL CAST JC6061-T6C

FIG. 3



200X UNHIPPED CENTRIFUGAL CAST JC6061-T6C

FIG. 4



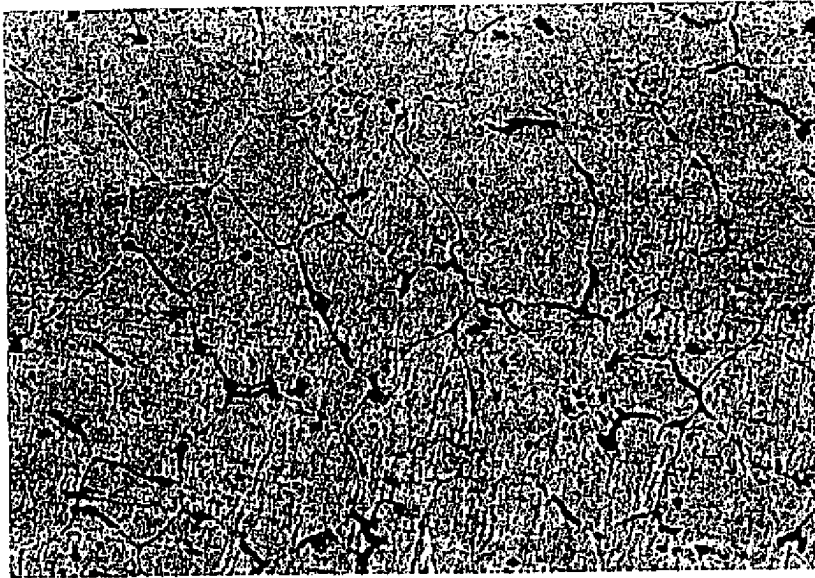
50X CENTRIFUGAL CAST AND HIPPED JC6061-T6C

FIG. 5



100X CENTRIFUGAL CAST AND HIPPED JC6061-T6C

FIG. 6



200X CENTRIFUGAL CAST AND HIPPED JC6061-T6C

FIG. 7